

REMARKS

Claims 1-32, 35-37 and 40-43 are pending. By this Amendment, no claims are cancelled, claims 32 and 37 are amended and no new claims are added.

Interview Summary

Applicant thanks Examiner Crandall and Supervisory Examiner Johnson for their time and courtesy in the telephonic interview of October 14, 2010. Applicant's undersigned representative and Examiners' Crandall and Johnson discussed claim 32 and the prior art references Freedman and Schröder. Applicant's representative attempted to clarify the distinctions between the currently claimed invention and the Freedman and Schröder references. The remarks in this Amendment will also further clarify those distinctions.

During the interview it became apparent that some confusion existed as to the invention being claimed in claims 32, 35-37 and 40-43 relative to the embodiments disclosed in the specification of this application. The claimed invention is described throughout the specification and drawings, for example, in the following paragraphs of the published application, 0031-0038, 0113-0133 and 0150-0160. The embodiment claimed is also depicted, for example, in Figure 9. Certain features of the presently claimed invention are depicted in Figures 19 and 20-22. In particular, it is noted that the claimed embodiment of the invention does not include the embodiments disclosed in the specification that include optical coherence tomography.

Claim Objections

The Office Action objected to claim 31 for having an incorrect status identifier having been identified as “original” when claim 31 has been withdrawn. By this Amendment, Applicant has corrected this typographical error. Applicant respectfully requests that the Examiner withdraw the objection.

35 U.S.C. § 103

The Office Action rejected claims 32, 35-37, 40-43 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,454,761 to Freedman in view of U.S. Patent 6,613,041 to Schröder. Applicant respectfully traverses the rejection.

The Freedman reference is directed to a device that operates based on optical coherence tomography. While the present application discloses embodiments that involve optical coherence tomography, the presently claimed invention in claims 32, 35-37 and 40-43 involves techniques more akin to confocal laser microscopy. The claimed invention does not involve optical coherence tomography or interferometry. Applicant traverses the rejections for the following reasons.

The Cited Prior Art Does Not Disclose Or Suggest Three Dimensional Scanning Of The Focal Point of The Illumination Radiation.

In particular, independent claim 32 recites the limitations “focusing the illumination laser radiation at a focal point in the tissue; three dimensionally scanning the tissue with the illumination laser radiation by changing the position of the focal point within the tissue in three

dimensions.” These limitations are not disclosed or suggested by Freedman, because Freedman utilizes an optical coherence tomography technique.

Optical coherence tomography may be thought of as the optical analog of ultrasonography or sonar. In optical coherence tomography, illumination radiation is directed at the structures to be scanned, however, the radiation is not focused at any particular location in the structures. It is merely directed at the structures. While three dimensional information is obtained from optical coherence tomography, “scanning” is done by the interferometry structures that receive radiation back scattered or otherwise returned from the sample that is being evaluated. Accordingly, in optical coherence tomography, no *illumination laser radiation* is focused at a focal point in the tissue or scanned three dimensionally in the tissue that is being evaluated. Accordingly, these limitations of claim 32 are not disclosed or suggested by the Freedman reference because the optical coherence tomographer disclosed by Freedman does not scan a focal point of the illumination radiation in three dimensions.

These limitations are also not disclosed or suggested by Schröder. Schröder discloses a device that applies excitation radiation to the *surface* of a structure to measure the surface topography of the structure based on fluorescence arising from the surface tissues subjected to the excitation radiation. Therefore, in Schröder the illumination radiation is directed to the tissue structure but is not focused at a focal point in the tissue and is not three dimensionally scanned within the tissue in three dimensions as recited in claim 32. Accordingly, at least this limitation of independent claim 32 is not disclosed by either the Freedman or Schröder references and claim 32 as amended should be patentable for at least this reason. Claims 35 and 36 depend from claim 32 and should be patentable for at least the same reasons as claim 32.

Similarly, independent claim 37 recites the limitations “a control unit which controls the source of laser radiation, the deflecting unit and the focusing unit operably interacting such that the position of the focal point is three-dimensionally scanned by the deflecting unit and the focusing unit over a plurality of positions within the tissue.” Similar to independent claim 32, these limitations are not disclosed or suggested by either Freedman or Schröder and claim 37 should be patentable for at least this reason. Claims 40-43 depend from claim 37 and should be patentable for at least the same reasons as claim 37. Accordingly amended claims 32 and 37 should be patentable for at least this reason.

The Cited Prior Art Does Not Disclose Or Suggest Filtering Out The Points Of Measurement At Which Predefined Values Were Detected For The Tissues Specific Signals

Independent claim 32, as amended, also recites the limitations

determining positions of boundaries in the tissue, inclusions in the tissue or both by filtering out the points of measurement at which predefined values were detected for the tissue specific signals;  
defining target points within the tissue based on the points of measurement remaining after the filtering out;  
performing a subsequent treatment of the tissue by focusing treating laser radiation into the tissue and scanning the treating laser radiation over the target points within the tissue.”

These limitations are also not disclosed or suggested by either the Freedman or Schröder references. According to the Freedman reference at Col. 5, lines 29-36

Processor 48 compares spatialgram data to data representing a standard of improved visual acuity to construct an ablating plan. Processor 48 can construct a virtual or real time display three dimensional image of the cornea film for the spatialgram and construct an ablating plan by comparing the constructed image to a representation of a standard of improved acuity. Processor 48 controls ablating laser 52 in accordance with the ablating plan.”

Because Freedman generates a spatialgram, which is a three dimensional image of the cornea and constructs an ablating plan by comparing the constructed image to a representation of a standard of improved acuity, which is understood to be an idealized virtual model of the eye Freedman does not disclose the above quoted limitations of claim 32. Claim 37 recites similar limitations.

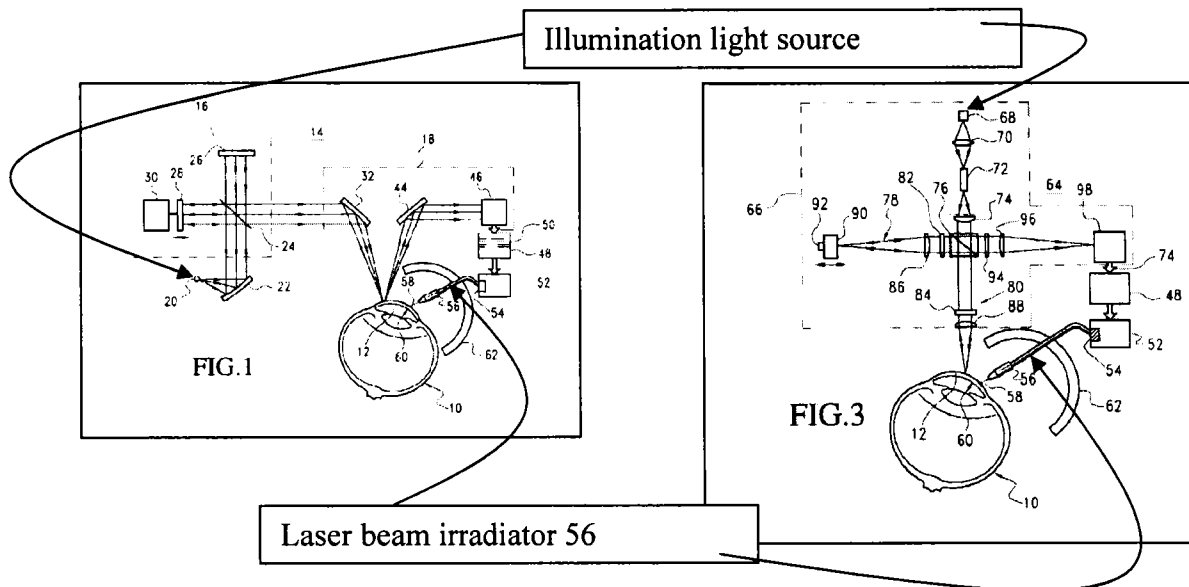
As discussed above Schrunder teaches excitation of fluorescence and measurement of the topography of the fluorescing surface. Therefore Schrunder does not teach these limitations either. Accordingly amended claims 32 and 37 should be patentable for at least this additional reason.

The Cited Prior Art Does Not Disclose Or Suggest That The Treating Laser Radiation And The Illumination Laser Radiation Are Focused And Scanned By The Same Optical Elements

Claim 32 also recites the limitations “wherein the treating laser radiation and the illumination laser radiation are focused and scanned by the same optical elements.” Claim 37

recites the limitations “wherein the treating laser radiation and the illumination laser radiation are both deflected by the deflecting unit and focused by the focusing unit.”

These limitations are not disclosed or suggested by either the Freedman reference or the Schründer reference. Referring to Figure 1 and 3 of Freedman reproduced below,



Freedman recites: “Ablating laser device 52 includes laser generator 54 and laser beam irradiator 56 for applying a laser beam from the laser generator 54 as ablating beam 58 to an ablating target region 60 of the cornea 12 to form an incision.” Freedman, Column 7, Lines 9-14.

Ablating laser device 52, including laser generator 54 and laser beam irradiator 56 applies ablating (treating laser radiation) energy to the eye. Illumination light arises from light source 20 in Fig. 1 and from laser diode 68 in Fig 3. As can be seen, according to Freedman, treating laser radiation and illumination radiation follow different optical paths. Thus, as disclosed by Freedman treating laser radiation and the illumination laser radiation are *not* focused and scanned by the same optical elements as recited in claim 32. See Freedman, Col. 4, Lines 58-59

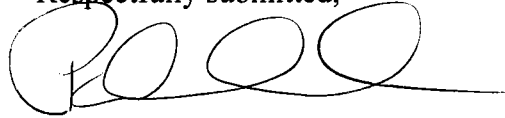
and Col. 6 Lines 20-21. Accordingly, Freedman does not disclose or suggest the limitation “wherein the treating laser radiation and the illumination laser radiation are focused and scanned by the same optical elements.”

Neither is this limitation disclosed or suggested by the Schröder reference, since Schröder does not disclose or suggest “wherein the treating laser radiation and the illumination laser radiation are focused and scanned by the same optical elements.” Accordingly, independent claims 32 and 37 should be patentable for at least this additional reason. Claims 35 and 36 depend from claim 32 and should be patentable for the same reason as claim 32. Claims 40-43 depend from claim 37 and should be patentable for at least the same reason as claim 37. Applicant respectfully requests that the Examiner withdraw the rejections.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'P. C. Onderick', with a long horizontal flourish extending to the right.

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